USDA FOREST SERVICE, R-4
VERNAL WAREHOUSE OFFICE HEATING/COOLING AND ELECTRICAL
SECTION 001025 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Measurement and payment for contract work will be made only for and under those pay items included in the Schedule of Items. All other work, labor, materials, equipment, and incidentals necessary to successfully complete the project will be considered as included in the payment for items shown. This section defines the method of measurements and basis of payment for work items listed in the Schedule of Items.

B. When more than one class, size, type, thickness, etc. is specified in the Schedule of Items for any pay item, suffixes will be added to the item number to differentiate between the pay items.

1.2 UNITS OF MEASUREMENT

A. Payment shall be by units defined and determined according to U.S. Standard measure and by the following:
   1. Lump Sum (LS): One complete unit.

1.3 METHOD OF MEASUREMENT

A. One of the following methods of measurement for determining final payment is designated on the Schedule of Items for each pay item:
   1. LUMP SUM QUANTITIES (LSQ) - These quantities denote one complete unit of work as required by or described in the contract, including necessary materials, equipment, and labor to complete the job. They shall not be measured.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 001025

USDA FOREST SERVICE R-4
VERNAL WAREHOUSE OFFICE HEATING/COOLING AND ELECTRICAL

SECTION 001300--SUBMITTALS

PART I - GENERAL

1.01 **Scope** - This section covers the contractor's responsibility relating to all submittals - shop drawings, samples and substitutions - that relate to the construction of the work.

1.02 **Measurement and Payment** - No separate measurement and/or payment will be made for this Section. Refer to Section 000050, Project Description for a description line items.

PART II - PRODUCTS (Not Applicable)

PART III - EXECUTION

3.01 **All Submittals** - It will be the Contractor's responsibility to submit all items with such promptness as to cause no delay in the work. Approvals must be obtained before starting work which involves the submittal. Contractor shall allow 15 calendar days for processing of submittals by the Government.

3.02 **Manufacturer's Literature and Shop Drawings**

A. Submit four (4) copies to the Contracting Officer for approval on the items required herein. Literature which is not marked or otherwise designated to show the exact model, size, etc., the contractor proposed to use, will be returned by the Contracting Officer "without action." Circle or check items on submittals. Highlighter pens may print black or not at all when copied and should not be used.

B. Information must be adequate to determine compliance with specifications.

C. Submittals which are received from sources other than through contractor's office will be returned by the COR "without action."

3.03 **Samples** - Submit two samples of each color, style, etc. One sample of selected color, etc., will be retained. All other samples and all hardware samples will be returned.

3.04 **Substitutions** - Materials in the specifications may be followed by the words "or approved equal." In these cases, wherever the name or brand of a manufacturer's article is specified, it is used as a measure of quality and utility or a standard. If

contractor prefers to use any other brand or manufacturer of same quality, appearance and utility to that specified, he shall request substitution as provided below, not less than thirty (30) days before the planned installation of the item. Contracting Officer will approve or disapprove the request for substitution and his decision shall be final. Unless substitutions are requested within the time stated above and as provided below, no deviation from the specifications will be allowed.

Requests for substitutions will only be considered if contractor submits the following:

A. Complete technical data, complete performance specifications, test data, samples and perform tests of the article proposed for substitution. Submit additional information if required by Contracting Officer. All items in the above information shall be circled, tagged, or marked in some way to indicate all deviations or differences, which the proposed item differs from the originally specified item.

B. Similar data as above for item originally specified. All items shall be marked to identify where/how the proposed substitution will differ.

C. Statement by contractor that the proposed substitution is in full compliance with the contract documents and applicable codes, and laws.

D. List of other trades (if any) which may be affected by the substitution.

E. Contractor shall be responsible for any effect upon related work in the project for any substitution and shall pay any additional costs generated by any substitutions.

SEE TABLE BELOW:

Reference Section	**Description**	**Due Date**
230000.1.6	Shop Drawings and Calculations	Before work begins.
231940.1.3.A	Product Data	Before work begins.
231940.1.3.B	Test Reports	Before work begins.
235300.1.3.A	Product Data	Before work begins.
235300.1.3.B	Diagrams	Before work begins.
235300.1.3.C	O and M manuals.	After Completion.

END SECTION 001300

USDA FOREST SERVICE, R-4
VERNAL WAREHOUSE OFFICE HEATING/COOLING AND ELECTRICAL
SECTION 230000 - MECHANICAL GENERAL

PART 1 -

1.1 CODES AND STANDARDS

A. Comply with all current regulations of the Occupational Safety and Health Act.

B. Code Compliance: Complete mechanical system shall be installed in compliance with the following:
   1. International Plumbing Code as applicable.
   2. International Mechanical Code as applicable.
   3. International Fuel Gas Code as applicable.
   4. All requirements of U.S.D.A. Forest Service.

1.2 SCOPE OF WORK

A. It is the intention of these specifications to include a complete office heating system as called for herein. The contractor shall size the units based on conventional heat loss and gain standards. The Contractor is to furnish all labor, equipment, and materials and bear all expenses necessary to completion of the mechanical work as described in these specifications.

C. For the office space, the new equipment will require temperatures maintained between 68 and 74 degrees Fahrenheit (20 and 23° C). These temperatures must be maintained throughout the office regardless of outside temperatures, during hours of operation. The office will be occupied in the winter.

D. During non-working hours, heating temperatures shall be set no higher than 55 degrees Fahrenheit (13° C).

1.3 STORAGE AND PROTECTION OF MATERIAL AND EQUIPMENT

A. All materials and equipment stored and handled so as to preclude the inclusion of foreign matter and damage by water or breakage. Store packaged materials in original containers until ready for use. Packages showing evidence of water or other damage may be rejected.

1.4 WORKMANSHIP

A. All workmanship shall be of the best quality. Only competent tradesmen shall be employed. Shoddy workmanship will be a cause for rejection and replacement of installed work without additional cost to the Government. Contracting Officer to determine quality of work installed.

1.5 MEASUREMENT AND PAYMENT:

A. No separate measurement and/or payment will be made for this Section. Refer to Section 000050, Project Description for a description line items.

MATERIALS

All materials incorporated into the work other than specifically indicated, shall be new and of the best quality. The use of damaged or used materials other than those accepted above will not be permitted.

B. Insofar as possible, use same brand or manufacturer throughout for each class of material or equipment.

2.2 SHOP DRAWINGS AND CALCULATIONS

A. Complete shop drawings or detailed catalog information shall be submitted on the following listed items prior to manufacturer or shipment for review. Drawings shall give all necessary dimensional data for rough in for all services. All equipment performances shall be identified and shown on the submittal as a package for all components of the same heating system.
   1. Heating unit.
   2. Automatic temperature controls.
   3. Any specialized equipment furnished.

B. Shop drawings, review will be general. It shall not relieve Contractor or responsibility for accuracy of such shop drawings nor from proper fitting, construction of work, furnishing material or work required by contract and not indicated on shop drawings. Shop drawings review shall not be construed as approving departure from contract requirements unless Contractor has in writing calling the Contracting Officer's attention to such deviations at time of submission, nor shall it relieve him from responsibility for errors of any sort on shop drawings or schedules.

C. The contractor shall provide heating load assumptions and data generated to size equipment to the Contracting Officer's Representative for review before approval of equipment is provided.

EXECUTION

1.1 CUTTING AND PATCHING

A. Anticipate requirements and supply to the proper trade the location and size of openings, pipe sleeves, etc. Any cutting and patching of finished surfaces necessary because of the failure to make requirements known will be

accomplished by the proper trade.

COORDINATION WITH OTHER TRADES

Closely coordinate work with all trades to provide sufficient space for, and prevent interference with, the various other building systems. In some areas, space has been closely allotted to particular building components. Careless or unplanned installation of any one component will cause interference, which will not be permitted.

PIPE INSTALLATION - ROUTING

Unless otherwise shown all piping shall be installed parallel to walls and floor with all vertical piping plumb.

TESTS

Comply with Natural Gas Testing requirements of International Fuel Gas Code.

EQUIPMENT START-UP

A. Do not start any contractor-furnished equipment until review with Contracting Officer. Do not start any equipment furnished by others.

B. Comply with all manufacturers' instructions before and during start up.

C. After placing systems in operation, check immediately for abnormal pressures, temperatures, noise or system malfunction.

OPERATING AND MAINTENANCE INSTRUCTIONS

A. This Contractor shall prepare complete detailed parts, wiring diagrams and maintenance instruction manuals for all equipment furnished.

B. Three (3) bound copies of the parts lists and maintenance instruction manuals shall be submitted to the Contracting Officer. These instructions shall include the name, address and telephone number of the supplier of each major piece of equipment and the name and telephone number of where competent maintenance service and spare parts may be obtained.

CLEAN UP

A. Completely clean up all piping, ductwork and equipment installed as part of this section.

B. Remove and legally dispose of all rubble, trash, shipping containers generated.

C. Clean and polish all exposed copper pipe, remove solder drippings and burned areas.

GUARANTEE

A. Contractor shall guarantee all material and equipment furnished to be free of defect of either material or workmanship for a period of one (1) year from final acceptance by the Contracting Officer.

END OF SECTION 230000

USDA FOREST SERVICE, R-4
VERNAL WAREHOUSE OFFICE HEATING/COOLING AND ELECTRICAL
SECTION 231940 - FUEL GAS PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes fuel gas piping within the building. Products include the following:
   1. Pipe, tube, fittings, and joining materials.
   2. Protective pipe and fitting coating.
   3. Piping specialties.
   4. Specialty valves.
   5. Pressure regulators.

1.2 PROJECT CONDITIONS

A. Gas System Pressure: One pressure range, 0.5 PSI or less.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field quality-control test reports.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. NFPA Standard: Comply with NFPA 54, "National Fuel Gas Code."

1.5 MEASUREMENT AND PAYMENT:

A. No separate measurement and/or payment will be made for this Section. Refer to Section 000050, Project Description for a description line items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe and joining materials.

B. Steel Pipe: ASTM A 53/A 53M; Type E or S; Grade B; black. Wall thickness of wrought-steel pipe shall comply with ASME B36.10M.
1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern, with threaded ends according to ASME B1.20.1.
2. Steel Threaded Fittings: ASME B16.11, forged steel with threaded ends according to ASME B1.20.1.
3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends according to ASME B1.20.1.
4. Joint Compound and Tape: Suitable for natural gas.

2.3 PROTECTIVE COATING

A. Furnish pipe and fittings with factory-applied, corrosion-resistant polyethylene coating for use in contact with materials that may corrode the pipe, or when piping is installed in a crawl space.

2.4 PIPING SPECIALTIES

A. Flexible Connectors: ANSI Z21.24, copper alloy.

B. Quick-Disconnect Devices: ANSI Z21.41, convenience outlets and matching plug connector.

2.5 SPECIALTY VALVES

A. Valve End Connections: Threaded, according to ASME B1.20.1.

B. Appliance Connector Valves: ANSI Z21.15 and CSA International listed.

C. Gas Stops: Bronze body with AGA stamp, plug type with bronze plug and flat or square head, ball type with chrome-plated brass ball and lever handle, or butterfly valve with stainless-steel disc and fluorocarbon elastomer seal and lever handle; minimum pressure rating.

D. Gas Valves: ASME B16.33 and CSA International-listed bronze body and pressure rating.

E. Earthquake Valves: Listed in CSA International's "Certified Product Listing Directory: Components for Gas and Electrical Equipment" as complying with ASCE 25 and UL listed.

1. Earthquake-Valve, Type 1: Working-pressure rating is as noted on the drawings. Cast-aluminum body with stainless-steel internal parts. Buna-N, reset-stem, O-ring seal. Threaded end connections.
   a. Available Manufacturers:
      1) Safe T Quake Corp.

PART 3 - EXECUTION

3.1 PREPARATION

A. Close equipment shutoff valves before turning off fuel gas to premises or section of piping. Perform leakage test as specified in "Field Quality Control" Article to determine that all equipment is turned off in affected piping section.

3.2 PIPING APPLICATIONS

A. Use unions, transition, and special fittings in applications below, unless otherwise indicated.

B. Fuel Gas Piping:
   1. 3-inch and Smaller: Steel pipe, malleable-iron threaded fittings, and threaded joints.

3.3 VALVE APPLICATIONS

A. Appliance Shutoff Valves: Gas stop or gas valve.

B. Valves at Service Meter: Gas valve.

3.4 INSTALLATION

A. Drips and Sediment Traps: Install drips at points where condensate may collect. Include outlets of service meters. Locate where readily accessible for cleaning and emptying. Do not install where condensate would be subject to freezing.
   1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use minimum-length nipple of 3 pipe diameters, but not less than long, and same size as connected pipe. Install with space between bottom of drip and floor for removal of plug or cap.

B. Install fuel gas piping at uniform grade of 0.1 percent slope upward toward risers.

C. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.

D. Connect branch piping from top or side of horizontal piping.

E. Install unions in pipes and smaller, adjacent to each valve, at final connection to each piece of equipment, and elsewhere as indicated. Unions are not required on flanged devices.

F. Install corrugated stainless-steel tubing system according to manufacturer's written instructions. Include striker plates to protect tubing from puncture where tubing is restrained and cannot move.

3.5 CONNECTIONS

A. Install piping adjacent to appliances to allow service and maintenance. Connect piping to appliances using gas with shutoff valves and unions. Install valve upstream from and within of each appliance. Install union downstream from valve.

3.6 FIELD QUALITY CONTROL

A. Test, inspect, and purge piping according to NFPA 54 and requirements of authorities having jurisdiction. Repair leaks and defects with new materials and retest system until satisfactory results are obtained.

END OF SECTION 231940

USDA FOREST SERVICE, R-4
VERNAL WAREHOUSE OFFICE HEATING/COOLING AND ELECTRICAL
SECTION 235300 –GAS FURNACES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Room Furnaces and accessories complete with controls.

1.2 SUBMITTALS

A. Product Data: Include rated capacities of selected models, furnished specialties, and accessories for each furnace. Include plan and elevation views of units, minimum clearances, and data on ratings and capacities.

B. Wiring Diagrams: Power, signal, and control wiring.

C. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace furnace combustion chamber if it fails in materials and workmanship within 10 years from date of Substantial Completion. All other parts shall carry a one year warranty.

1.6 MEASUREMENT AND PAYMENT:

A. No separate measurement and/or payment will be made for this Section. Refer to Section C, Project Description for a description line items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 GAS-FIRED FURNACES: **Basis of design unit; Direct Vent natural gas heater <u>such as Empire Comfort Systems DV-25 w/ Blower Kit or approved equal</u>. See attached Installation Guide for Empire Comfort Systems DV-25.**

A. Other Manufacturers:
   1. Rinnai
   2. Cozy Direct.

B. Description: Direct vent, wall mounted heater with sealed combustion chamber, integral controls, painted steel cabinet and automatic shut off.

C. Cabinet: Steel, with interior insulation around heat exchanger.

D. Finish of External Casings and Cabinets: Factory painted, manufacturer's standard color.

F. Type of Gas: Natural Gas

G. Blower Kit

2.3 CONTROLS

A. Furnace Controls: Matchless piezo ignition system.

G. Thermostat: Millivolt Wall mounted programmable thermostat with positive off. Programmable for Occupancy and Non-Occupancy periods of day and days of week.

PART 3 - EXECUTION

3.1 FURNACE INSTALLATION

A. Install gas-fired furnaces and associated fuel and vent features and systems according to NFPA 54 and as directed by manufacturer’s instructions.

B. Controls: Install thermostats at mounting height of 48 inches above floor.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect gas piping according to Division 23 Section "Fuel Gas Piping."

C. Vent and Outside-Air Connection: Connect piping vent material as recommended by the furnace manufacturer to the furnace connections and extend outdoors. Terminate vent outdoors with a cap and heat shield and in an arrangement that will protect against entry of birds, insects, and dirt. Seal around exterior wall penetration to ensure watertight seal.

D. Install piping adjacent to furnace to allow service and maintenance.

3.3 ADJUSTING

A. Adjust initial temperature set points.

B. Set controls, burner, and other adjustments for optimum heating performance and efficiency. Adjust heat-distribution features, including shutters, dampers, and relays, to provide optimum heating performance and system efficiency.

3.4 CLEANING

A. After completing installation, clean furnaces internally according to manufacturer's written instructions.

END OF SECTION 235300

USDA FOREST SERVICE, R-4
VERNAL WAREHOUSE OFFICE HEATING/COOLING AND ELECTRICAL

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 2 - GENERAL

SUMMARY

Section Includes:

Electrical equipment coordination and installation.
Common electrical installation requirements.

SUBMITTALS

Product Data:

For any substitutions for equipment referred to by name.

QUALITY ASSURANCE

The installation shall conform to the 2011 Edition of the National Electrical Code (NFPA 70) and to the requirements specified herein.

The Contractor shall perform all work necessary and required to accomplish the task as detailed on the drawings and discussed in the installation notes. All work shall be done by a state licensed electrician.

MEASUREMENT AND PAYMENT

The work in this section, including all telecommunications wiring and incidentals in other electrical sections, shall be measured and paid for by the following method as shown in the Schedule of Items:

Incidental to the building item or included as part of other pay items or separate as shown in the Schedule of Items.

PRODUCTS

PRODUCTS REFERRED TO BY NAME

The materials referred to by trade name, make, or catalog number on the drawings shall be regarded as establishing a minimum standard of quality; substitutions of equal or greater quality can be made by submitting a data sheet of the proposed substituted item to the Contracting Officer, for approval.

EXECUTION

COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

Comply with NECA 1.

Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

Right of Way: Give to piping systems installed at a required slope.

ELECTRICAL PENETRATIONS

Aboveground, Exterior-Wall Penetrations: Seal exterior opening around the raceway or cable, using a flexible, waterproofing, joint sealant appropriate for size, depth, and color to closely match the surrounding surface. Finish interior openings, filling opening and matching the exiting surface with appropriate materials and finish quality for the space.

END OF SECTION 260500
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VERNAL WAREHOUSE OFFICE HEATING/COOLING AND ELECTRICAL

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 3 - GENERAL

SUMMARY

This Section includes the following:
Building wires and cables rated 600 V and less.
Connectors, splices, and terminations rated 600 V and less.

QUALITY ASSURANCE

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Comply with NFPA 70.

MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PRODUCTS

CONDUCTORS AND CABLES

Copper Conductors: Comply with NEMA WC 70.

Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.

Insulation shall be “Sunlight Resistant” where exposed to direct sunlight.

CONNECTORS AND SPLICES

Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

EXECUTION

CONDUCTOR MATERIAL APPLICATIONS

Typical: Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

Control Wiring: Solid or stranded for No. 10 AWG and smaller.

EQUIPMENT GROUNDING

Install insulated equipment grounding conductors with all feeders and branch circuits. Where not otherwise shown in the drawings size per NEC 250.122 minimum.

CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

Exposed Branch Circuits: Type THHN-THWN, single conductors in raceway.

Class 2 Control Circuits: Power-limited cable, concealed in building finishes.

INSTALLATION OF CONDUCTORS AND CABLES

Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

CONNECTIONS

Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

FIELD QUALITY CONTROL

Remove and replace malfunctioning or damaged units.

END OF SECTION 260519

USDA FOREST SERVICE, R-4
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SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 4 - GENERAL

SUMMARY

This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

DEFINITIONS

EMT: Electrical metallic tubing.

FMC: Flexible metal conduit.

QUALITY ASSURANCE

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Comply with NFPA 70.

MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PRODUCTS

METAL TUBING

EMT: ANSI C80.3.
Fittings for EMT: Steel or die-cast, set-screw or compression type.

FMC: Zinc-coated steel.

Fittings for Conduit (Including Flexible), and EMT: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
Fittings for EMT: Steel or die-cast, set-screw or compression type.

BOXES, ENCLOSURES, AND CABINETS

Sheet Metal Outlet and Device Boxes: NEMA OS 1.

Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

EXECUTION

RACEWAY APPLICATION

Outdoors: Apply raceway products as specified below, unless otherwise indicated:
Exposed Conduit: EMT where UL listed raintight fittings are used and the raceway is 6-inch (150-mm) minimum above finished grade.
Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

Comply with the following indoor applications, unless otherwise indicated:
Exposed: EMT.
Boxes and Enclosures: NEMA 250, Type 1.

INSTALLATION

Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

Complete raceway installation before starting conductor installation.

Flexible Conduit Connections: Use maximum of 36 inches (915 mm) of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

END OF SECTION 260533

USDA FOREST SERVICE, R-4
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SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 5 - GENERAL

SUMMARY

This Section includes the following:
Equipment identification labels.

QUALITY ASSURANCE

Comply with NFPA 70.

Comply with 29 CFR 1910.145.

MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PRODUCTS

EQUIPMENT IDENTIFICATION LABELS

Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

Label shall include the following: "Heat Tape Control – Winter use only."

EXECUTION

APPLICATION

Equipment Identification Label: On snap switch only.

INSTALLATION

Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

END OF SECTION 260553

USDA FOREST SERVICE, R-4
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SECTION 262726 - WIRING DEVICES

PART 6 - GENERAL

SUMMARY

This Section includes the following:
Snap switch.
Timer switch.

QUALITY ASSURANCE

Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Comply with NFPA 70.

MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for work specified in this section. All work will be included in other items listed in the Schedule of Items.

PRODUCTS

MANUFACTURERS

Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
Leviton Mfg. Company Inc. (Leviton).
Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour or P&S).
Bryant Electric Incorporated, a division of Hubbell Incorporated (Bryant).

SNAP SWITCHES

Comply with NEMA WD 1 and UL 20.

Double Pole Switches, 120/277 V, 20 A, 2 HP @ 240 V:

See the attached Table for acceptable products and manufacturers. Types to be coordinated with the drawings. Submittals from manufacturers not shown of equal or better products will be considered.

	Manufacturer				
Device	Bryant	Cooper	Hubbell	Leviton	P&S
Switch	CSB220BI	CSB220I	CSB220I	CSB2-20I	CSB20AC2I

TIMER SWITCHES

Spring Wound Timer: Intermatic FD46H, 6 hour time cycle, DPST, 10 amp, 240 V, 2 HP @ 240 V.

WALL PLATES

Single and combination types to match corresponding wiring devices.
Material for Unfinished Spaces: Galvanized steel.

EXECUTION

OPERATION

Both switches shall be wired to control the heat trace in parallel. The double pole switch shall be for automatic operation controlling the heat trace through the rain/snow sensor controller. The timer switch will bypass the controller and turn on the heat trace for the amount of time selected.

LOCATION

Locate near the northwest personnel entrance, on the hinge side of door.

INSTALLATION

Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

Conductors:

Do not strip insulation from conductors until just before they are spliced or terminated on devices.

Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

Device Installation:

Keep each wiring device in its package or otherwise protected until it is time to connect conductors.

Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.

When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.

Use a torque screwdriver when a torque is recommended or required by the manufacturer.

Tighten unused terminal screws on the device.

When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

END OF SECTION 262726